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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,126	04/11/2005	Vitaly M Pirozhenko	22S01.1-011	4972

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EXAMINER	
LE, TUNG X	

ART UNIT	PAPER NUMBER
2821	

DATE MAILED: 08/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/531,126	PIROZHENKO ET AL.	
	Examiner	Art Unit	
	Tung X. Le	2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,9,12-21,26-38 and 40-43* is/are rejected.

7)☒ Claim(s) *7,8,10,11,22-25 and 39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This is a response to the applicant's filing on April 11, 2005. In virtue of this filing, claims 1-43 are currently presented in the instant application.

Claim Objections

2. Claims 1, 12 and 32 are objected to because of the following informalities:

Claim 1, line 5, "and," should be changed to -- and --.

Claim 12, line 6, "and," should be changed to -- and --.

Claim 32, line 5, "and," should be changed to -- and --.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-6, 9, 12-21, 26-38 and 40-43 are rejected under 35 U.S.C. 102(e) as being anticipated by Yu et al. (U.S. 6,448,722 B1).

With respect to claim 1, Yu discloses in figure 1 a particle accelerator system (10) comprising an injector (the injecting section including elements 12, 16, 28 and 80) for emitting charged particles (column 2, lines 26+); a bunching section (the section from end plate 16 to the small drift 61) having a plurality of bunching cavities (see the

cavities between elements 14) therein, the bunching cavities being operable to receive charged particles from the injector and to bunch the received charged particles (see column 2, lines 26+); and an accelerating section (the section that connected to the bunching section at element 61 to the ended beam 29) directly coupled to the bunching section, the accelerating section being operable to receive bunched charged particles from the bunching section and to accelerate the bunched charged particles (see figure 1, column 7 and lines 32+).

With respect to claim 2, Yu discloses that the bunching section and the accelerating section are coupled for the communication of radio-frequency power (see column 4, lines 60+, the RF power not shown and connected directly from element/cathode 28) from the accelerating section into the bunching section (see figure 1).

With respect to claim 3, Yu discloses that the bunching section and the accelerating section are connected by a passageway (see a passageway at the drift element 61) adapted to allow radio frequency power to propagate from the accelerating section into the bunching section (see figure 1).

With respect to claim 4, Yu discloses that the accelerating section has a port (the output port at element 29) and wherein the particle accelerator system further comprises a radio-frequency source (not shown and see column 4, lines 60+) connected to the port, the radio-frequency power source being adapted to supply radio-frequency power to the accelerating section and to the bunching section through the port (see figure 1).

With respect to claim 5, Yu discloses that the accelerating section has an end (18) at which a beam (29) of accelerated charged particles is output, and wherein the accelerating section defines the port at the end (see figure 1).

With respect to claim 6, Yu discloses that the bunching section and the accelerating section are adapted receive radio frequency power from a single radio frequency power source (see figure 1, column 4 and lines 60+).

With respect to claim 9, Yu discloses that the particle accelerator system further comprises a radio-frequency power source (figure not shown and see column 4, lines 60+) adapted to produce radio frequency power for delivery to both of the accelerating section and the bunching section, and wherein accelerating section is communicatively interposed between the bunching section and the radio frequency power source (figure 1, column 4, lines 60+), the accelerating section being operable to communicate the radio frequency power from the radio frequency power source to the bunching section (see figure 1).

With respect to claim 12, Yu discloses in figure 1 a particle accelerator system (10) comprising an injector (the injecting section including elements 12, 16, 28 and 80) for emitting charged particles (column 2, lines 26+); a bunching section (the section from end plate 16 to the small drift 61) operable to receive charged particles from the injector and to bunch the received charged particles (column 2, lines 26+); an accelerating section (the section that connected to the bunching section at element 61 to the ended beam 29) operable to receive bunched charged particles from the bunching section and to accelerate the bunched charged particles (column 2, lines 26+);

and a coupling cavity (the cavity between elements 14) interposed between the bunching section and the accelerating section (figure 1).

With respect to claim 13, Yu discloses that a wall (see the small drift 61) extending between the bunching section and the accelerating section, and wherein the wall defined the coupling cavity therein (see figure 1).

With respect to claim 14, Yu discloses that the wall further defines a first passageway (see in the bunching section of the first common wall of element 14) extending between the bunching section and the coupling cavity, and wherein the wall further defines a second passageway (see in the accelerating section of the first common wall of element 14) extending between the accelerating section and the coupling cavity (see figure 1).

With respect to claim 15, Yu discloses that the first passageway, the second passageway, and the coupling cavity are adapted to enable radio frequency power to propagate from the bunching section to the accelerating section (see figure 1, column 4 and lines 60+).

With respect to claim 16, Yu discloses that the first passageway, the second passageway, and the coupling cavity are adapted to enable charged particles to travel from the bunching section to the accelerating section (see figure 1, column 4 and lines 60+).

With respect to claim 17, Yu discloses that the coupling cavity is adapted to communicate radio frequency power (not shown) from the accelerating section into the bunching section (see figure 1).

With respect to claim 18, Yu discloses that the coupling cavity comprises a resonant coupling cavity (see figure 1, column 3 and lines 33).

With respect to claim 19, Yu discloses that the accelerating section has a port (the output port at element 29) and wherein the particle accelerator system further comprises a radio-frequency source (not shown and see column 4, lines 60+) connected to the port, the radio-frequency power source being adapted to supply radio-frequency power to the accelerating section and to the bunching section through the port (see figure 1).

With respect to claim 20, Yu discloses that the bunching section and the accelerating section are adapted receive radio frequency power from a single radio frequency power source (see figure 1, column 4 and lines 60+).

With respect to claim 21, Yu discloses that the particle accelerator system further comprises a radio-frequency power source (figure not shown and see column 4, lines 60+) adapted to produce radio frequency power for delivery to both of the accelerating section and the bunching section, and wherein accelerating section is communicatively interposed between the bunching section and the radio frequency power source (figure 1, column 4, lines 60+), the accelerating section being operable to communicate the radio frequency power from the radio frequency power source to the bunching section (see figure 1).

With respect to claims 26-27, Yu discloses that the bunching section comprises a plurality of bunching cavities (see several cavities formed by elements 14 in the

bunching section) therein and a plurality of coupling cavities (between elements 14) therein, and wherein at least one of the coupling cavities of the plurality of coupling cavities is interposed between successive bunching cavities of the plurality of bunching or coupling cavities (see in figure 1).

With respect to claim 28, Yu discloses that the bunching section comprises a plurality of bunching cavities (the bunching cavities formed by elements 14) therein and at least one coupling cavity therein (figure 1), and wherein the at least one coupling cavity is interposed between a first bunching cavity (between element 16 and the first element 14) of the plurality of bunching cavity of the plurality of bunching cavities (figure 1).

With respect to claim 29, Yu discloses that the particle accelerator system defines a passageway (see first cavity of the first element 14) extending between the at least one coupling cavity and the first bunching cavity of the plurality of bunching cavities (figure 1).

With respect to claim 30, Yu discloses that the passageway is adapted to enable radio frequency power (not shown) to propagate between the at least one coupling cavity and the first bunching cavity of the plurality of bunching cavities (see figure 1).

With respect to claim 31, Yu discloses that the passageway is adapted to enable charged particles (column 4, lines 60+) to travel between the at least one coupling cavity and the first bunching cavity of the plurality of bunching cavities (see figure 1).

With respect to claim 32, Yu discloses a particle accelerator system (10) comprising an injector (the injecting section including elements 12, 16, 28 and 80) for

emitting charged particles (column 2, lines 26+); a bunching section (the section fro end plate 16 to the small drift 61) having a plurality of bunching cavities (the cavities between elements 14) therein and at least one coupling cavity therein, the bunching cavities being operable to receive charged particles from the injector and to bunch the received charged particles (see column 2, lines 26+); and an accelerating section (the section that connected to the bunching section at element 61 to the ended beam 29) directly coupled to the bunching section, the accelerating section being operable to receive bunched charged particles from the bunching section and to accelerate the bunched charged particles (see figure 1, column 7 and lines 32+).

With respect to claim 33, Yu discloses that the bunching section and the accelerating section are coupled for the communication of radio-frequency power (see column 4, lines 60+, the RF power not shown and connected directly from element/cathode 28) from the accelerating section into the bunching section (see figure 1).

With respect to claim 34, Yu discloses that the bunching section and the accelerating section are connected by a passageway (see a passageway at the drift element 61) adapted to allow radio frequency power to propagate from the accelerating section into the bunching section (see figure 1).

With respect to claim 35, Yu discloses that the accelerating section has a port (the output port at element 29) and wherein the particle accelerator system further comprises a radio-frequency source (not shown and see column 4, lines 60+) connected to the port, the radio-frequency power source being adapted to supply radio-

frequency power to the accelerating section and to the bunching section through the port (see figure 1).

With respect to claim 36, Yu discloses that the bunching section and the accelerating section are adapted receive radio frequency power from a single radio frequency power source (see figure 1, column 4 and lines 60+).

With respect to claim 37, Yu discloses that the bunching section and the accelerating section are connected by a passageway (see a passageway at the drift element 61) adapted to allow bunched charged particles to propagate from the bunching section into the accelerating section (see figure 1).

With respect to claim 38, Yu discloses that the particle accelerator system further comprises a radio-frequency power source (figure not shown and see column 4, lines 60+) adapted to produce radio frequency power for delivery to both of the accelerating section and the bunching section, and wherein accelerating section is communicatively interposed between the bunching section and the radio frequency power source (figure 1, column 4, lines 60+), the accelerating section being operable to communicate the radio frequency power from the radio frequency power source to the bunching section (see figure 1).

With respect to claim 40, Yu discloses that the at least one coupling cavity is interposed between a first bunching cavity (the cavity between element 16 and 14) of the plurality of bunching cavities and a second bunching cavity (the cavity between the first element 14 and the second element 14) of the plurality of bunching cavities (figure 1).

With respect to claim 41, Yu discloses that the particle accelerator system (10) defines a passageway (see first cavity of the first element 14) extending between the at least one coupling cavity (the cavity between elements 14) and the first bunching cavity of the plurality of bunching cavities (figure 1).

With respect to claim 42, Yu discloses that the passageway is adapted to enable radio frequency power (not shown and column 4, lines 60+) to propagate between the at least one coupling cavity (between two elements 14) and the first bunching cavity of the plurality of bunching cavities (see figure 1).

With respect to claim 43, Yu discloses that the passageway is adapted to enable charged particles (column 2, lines 26+) to travel between the at least one coupling cavity and the first bunching cavity of the plurality of bunching cavities (figure 1).

Allowable Subject Matter

5. Claims 7-8, 10-11, 22-25 and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

Prior art of record fails to disclose or suggest the following limitations:

- A particle accelerator system comprising the common wall defining a passageway extending therethrough between the bunching section and the accelerating section, the passageway being adapted to enable electromagnetic power to propagate from the accelerating section into the bunching section, in

combination with the remaining claimed limitations as claimed in dependent claim 7 (claim 8 is objected for depending on claim 7).

- A particle accelerator system comprising a dimension of a first bunching cavity of the plurality of bunching cavities is greater than the dimension of a second bunching cavity of the plurality of bunching cavities, in combination with the remaining claimed limitations as claimed in dependent claim 10.
- A particle accelerator system comprising a dimension of each the bunching cavity of the plurality of bunching cavities increases in magnitude for each the bunching cavity positioned successively in the direction, in combination with the remaining claimed limitations as claimed in dependent claim 11.
- A particle accelerator system comprising a dimension of each the bunching cavity of the plurality of bunching cavities increases in magnitude for each the bunching cavity positioned successively in the direction, in combination with the remaining claimed limitations as claimed in dependent claim 22 (claims 23-25 are objected for depending on claim 22).
- A particle accelerator system comprising a dimension of each the bunching cavity of the plurality of bunching cavities increases in magnitude for each the bunching cavity positioned successively in the direction, in combination with the remaining claimed limitations as claimed in dependent claim 39.

Citation of Relevant Prior Art

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Swenson (U.S. 5,014,014) discloses a plane wave transformer linac structure.

Swenson et al. (U.S. 2004/0212331 A1) discloses a radio frequency focused interdigital linear accelerator.

Symons (U.S. 2003/0141448 A1) discloses a multi stage cavity cyclotron resonance accelerators.

Dresch et al. (U.S. 2001/0030284 A1) discloses an ion storage time of light mass spectrometer.

Inquiry

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung X. Le whose telephone number is 571-272-6010. The examiner can normally be reached on 8:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner
Tung Le
AU 2821

Hoanganh Le
Primary Examiner